CLAIMS

What is claimed is:

1. An optical interface assembly for interfacing a fiber optic connector to an optoelectronic device, said assembly comprising a retainer having a well for receiving a wedge and a sloping side wall that abuts a fiber stub array when the fiber stub array comes in contact with the wedge.

2. The interface assembly of claim 1, further comprising a two part plate assembly with provision for accepting an optoelectronic device, said two part plate assembly is mechanically coupled to said retainer by at least one of welding and applying epoxy.

3. The interface assembly of claim 1, further comprising a two part plate assembly and a connector latch, said two part plate assembly and said connector latch mechanically coupled to either side of the retainer.

4. The interface assembly of claim 1, wherein the retainer includes a notch along a base and wherein said notch is configured to fix the fiber stub array in the axial direction.

5. The interface assembly of claim 1, wherein the fiber stub array includes a plurality of passageways and at least one guide bore, said passageways and said guide bore are axially aligned to IEC 1754-5 standard.

6. The interface assembly of claim 1, wherein the fiber stub array includes a well for relieving excess epoxy, a sloping front face for mating with the conventional connector, and a sloping rear face for wire bonding.

7. The interface assembly of claim 1, further including register means and latch means for locating a conventional connector latch with respect to the retainer and for coupling the latch and the retainer.

8. The interface assembly of claim 1, wherein the fiber stub array is made of a first member and a second member and wherein the first and second members have keying features for alignment.

9. The interface assembly of claim 1, wherein the retainer is welded to a VCSEL plate assembly.

10. The interface assembly of claim 1, further comprising a plurality of V-grooves axially disposed within the fiber stub array.

11. The interface assembly of claim 1, further comprising a VCSEL plate assembly having a VCSEL array and a photodiode mounted thereon, wherein the VCSEL plate assembly is mechanically coupled to the retainer.

12. An optical interface connector for connecting a ferrule to an optoelectronic device comprising a base unit in mechanical engagement with a connector latch, said connector latch having detents and keying features for coupling the connector latch to the base unit, said base unit comprises at least one guide pin passing through a series of components, said components including an optoelectronic plate and a fiber stub array; and wherein said optoelectronic plate includes at least one alignment hole in a loose fit engagement with the at least one guide pin to thereby permit said optoelectronic plate to move in at least one of x, y and theta direction with respect to said base unit.

13. The interface connector of claim 12, wherein the optoelectronic plate comprises a first plate and a second ceramic substrate, and wherein the first plate is coupled to the base unit by welding.

14. The interface connector of claim 12, further including a VCSEL array and a photodiode in passive alignment with said optoelectronic plate.

15. The interface connector of claim 12, wherein the fiber stub array is made of a first member and a second member and wherein the first and second members have keying features for alignment.

16. The interface connector of claim 12, wherein the optoelectronic plate includes a ledge for registration between a first plate portion and a second plate portion.

17. The interface connector of claim 12, wherein the optoelectronic plate is welded to the base unit after the optoelectronic plate has been actively aligned with a conventional connector.

18. The interface connector of claim 12, wherein the connector latch is configured to accept a conventional ferrule and wherein the ferrule is configured to push the fiber stub array from a first position to a second position towards the base unit as the ferrule is received by the connector latch.

19. The interface connector of claim 12, further comprising a second guide pin for registering the components along approximately a single plane.

20. The interface connector of claim 12, further comprising a plurality of V-grooves axially disposed within the fiber stub array.

21. A connector for joining an optoelectronic device to a ferrule having a plurality of optical fibers therein, said connector comprising a VCSEL plate interposed between a VCSEL array and a photodiode; wherein said VCSEL array and said photodiode are wire bonded to a flex connector; and wherein said flex connector is supported by a backing plate.

22. The connector of claim 21, wherein the VCSEL plate includes a passage for allowing signals emitted from the VCSEL array to pass to the photodiode.

23. The connector of claim 21, wherein the flex connector includes a coplanar transmission line-based flex circuit.

24. The connector of claim 21, further comprising a fiber stub array disposed within a cradle.

25. The connector of claim 21, further comprising at least two guide pins for keying the ferrule to a fiber stub array.

26. The connector of claim 21, wherein the VCSEL plate is configured to accept a pair of guide pins, the pair of guide pins is configured to pass through a pair of guide holes disposed in a fiber stub array, and the fiber stub array is configured to be disposed within a cradle.

27. The connector of claim 22, wherein the cradle is coupled to the VCSEL plate by at least one of welding, applying epoxy, or friction from a latch means.

28. An interface unit for an optoelectronic device comprising a two-part cradle and a two-part fiber stub array in mechanical communication with a connector latch and an optoelectronic plate, said optoelectronic plate having an optoelectronic device coupled thereon.

29. The interface unit of claim 28, wherein the connector latch is coupled to the two-part cradle by a tongue and groove arrangement and is permanently attached therewith by epoxy.

30. The interface unit of claim 28, wherein the optoelectronic device includes a VCSEL array and a photodiode, and wherein the plate includes a weldable plate and a ceramic substrate.

31. The interface unit of claim 28, wherein the two-part cradle includes a notch and a guide disposed along a lower portion of the two-part cradle, and wherein the notch and the guide are configured to restrict the two-part fiber stub array from moving laterally and axially when nestled within the two-part cradle.

32. The interface unit of claim 28, wherein the two-part fiber stub array includes a plurality of V-grooves disposed along a lower portion of the two-part fiber stub array.

33. The interface unit of claim 32, further including a pair of guide pins situated in a pair of V-groove guides, said pair of guide pins protrude from the fiber stub array and are in contact on one end by a ferrule and on the other end by the optoelectronic plate.

34. An optical interface unit for coupling an optoelectronic device to a fiber connector, said interface unit comprising a cradle, a fiber stub array, a VCSEL plate assembly, and a connector latch; said cradle is configured to encase said fiber stub array and to fix an alignment gap between said fiber stub array and said VCSEL plate assembly; said VCSEL plate is configured to accept a VCSEL array and to permit signals from said VCSEL array to pass to a photodiode, which is mounted subjacent to the VCSEL array; said connector latch is configured to couple to said cradle by at least one of epoxy, detents, and restriction from a screw; and wherein said cradle is attached to said VCSEL plate assembly by at least one of welding and applying epoxy.

35. The interface unit of claim 34, including a wedge and a wedge hole for limiting the fiber stub array from moving laterally.

36. The interface unit of claim 34, wherein the cradle includes a cavity having four sides and wherein one of the sides has a slope.

37. The interface unit of claim 34, wherein the cradle includes a notch and a guide for limiting the fiber stub array from moving axially and laterally with respect to the cradle.

38. The interface unit of claim 34, further comprising a pair of guide pins fixedly attached to a pair of guide holes on the fiber stub array, said pair of guide pins is configured to guide said conventional connector and to align a plurality of fibers within said conventional connector to a plurality of fibers in said fiber stub array to about less than +/- 1 micron.

39. The interface unit of claim 34, wherein said fiber stub array includes an upper portion and a lower portion and further includes a plurality of V-grooves disposed axially on the lower portion.

40. An optical interface device, comprising:

a plastic housing having a plurality of axial passageways for receiving a plurality of optical fibers, each of said plurality of passageways extending longitudinally from a first optical surface to a second optical surface, and alignment guide holes extending longitudinally from the first optical surface to the second optical surface wherein said axial passageways are precisely aligned with said alignment guide holes, a cradle having an interior cavity and at least one protrusion for keying the plastic housing in at least one direction; and a connector latch in mechanical communication with the cradle by at least one of epoxy, detents, and pressure from a screw, and wherein the connector latch has an opening for receiving a conventional fiber optic connector.

41. The optical interface device of claim 40, wherein the plastic housing comprises an upper portion and a lower portion and wherein the plurality of passageways are disposed along the lower portion.

42. A method for coupling an optoelectronic device to a conventional latch and for receiving a conventional optic fiber connector, said method comprising:

providing a fiber stub array and inserting a pair of guide pins therein;

providing a two part VCSEL plate and aligning a VCSEL array and a photodiode to said two part VCSEL plate, wherein at least one of said two part VCSEL plate is made of a weldable material;

inserting and fastening said fiber stub array in a cradle;

coupling and fastening said fiber stub array and cradle combination to a connector latch;

inserting a conventional ferrule to the connector latch;

placing said fiber stub array, cradle, connector latch, and ferrule combination next to said VCSEL plate, VCSEL array, and photodiode combination and adjusting said two combinations while actively aligning said two combinations; and

welding a portion of said two part VCSEL plate to said cradle.

43. The method of claim 42, further comprising the steps of inserting a wedge in a wedge hole and pushing said fiber stub array to a side opposite the wedge so that the fiber stub array mates against a sloping side wall.

44. The method of claim 42, wherein the ferrule is guided within the connector by positioning means and to a final alignment with the fiber stub array by a pair of guide pins.

45. The method of claim 42, further comprising rotating the fiber stub array, cradle, connector latch, and ferrule combination along the x, y, or theta direction before welding.

46. The method of claim 42, further including the steps of wire bonding a flex circuit to the VCSEL array and photodiode.

47. A method for interfacing an optoelectronic device to a optic fiber connector, said method comprising:

aligning a VCSEL array and a monitor diode to a two part VCSEL assembly, said two part VCSEL assembly comprising a ceramic substrate and a weld plate;

press fitting at least one guide pin into a base unit and sliding said passively aligned VCSEL assembly onto the guide pin;

sliding a fiber stub array onto said at least one guide pin until contact is made between the fiber stub array and a portion of the aligned VCSEL assembly;

coupling a connector latch to the base unit by keying the connector latch to the base unit and then fastening the connector latch by at least one of epoxy, detents, and pressure force from a screw;

inserting the optic fiber connector into the connector latch until latching occurs between the connector latch and the optic fiber connector;

rotating the aligned VCSEL array assembly in at least one of x, y, and theta directions with respect to the base unit;

actively aligning the VCSEL array assembly to a plurality of optic fibers by monitoring signals generated by the VCSEL array; and

welding the weld plate to the base unit.

48. The method of claim 47, wherein the fiber stub array comprises two separable portions and wherein a plurality of V-grooves is disposed on one of the two separable portions.

49. The method of claim 47, further comprising the step of press fitting a second guide pin and fixing the two part VCSEL assembly and the fiber stub array along approximately a single plane.

50. The method of claim 48, further including the step of wire bonding the VCSEL array and the monitor diode to a flex connector.

51. The method of claim 50, wherein the flex connector includes coplanar transmission lines.

52. A method for interfacing a fiber optic connector to an optoelectronic component, said method comprising inserting a fiber stub array into a cradle assembly, securing the fiber stub array by wedging a wedge into a well and pushing the fiber stub array as it comes in contact with the wedge; and securing a connector latch to the cradle by keying and fastening.

53. An interface unit for interfacing a conventional connector to an optoelectronic device comprising a fiber stub array disposed between a first subassembly, said first subassembly including a conventional connector and a conventional latch, and a second subassembly, said second subassembly including an optoelectronic plate and an optoelectronic device mounted thereon, said cradle is aligned to said first subassembly by passive alignment in the x, y, z, and theta directions, and said cradle is aligned to said second subassembly by passive alignment in at least one direction and active alignment in at least one direction.

54. The interface unit of claim 53, wherein the fiber stub array is encased within a cradle.

55. The interface unit of claim 53, wherein the fiber stub array is made of two separable components and wherein V-grooves are disposed axially along one of the two components.

56. The interface unit of claim 53, further including a wedge for fixing the fiber stub array within a cradle.

57. The interface assembly of claim 1, further comprising an alignment hole for receiving an alignment pin from a connector latch.

58. The interface assembly of claim 1, further comprising an epoxy access hole for permitting epoxy to be added to secure the fiber stub array.

59. The interface assembly of claim 1, further comprising a connector latch mechanically coupled to the retainer, and wherein the connector latch comprises a keyway disposed along a surface of the connector latch.

60. The interface assembly of claim 57, further comprising a female detent for receiving a connector detent from said connector latch.